

CLAIMS

1 1. An optical amplifier comprising:
2 an amplification medium for amplifying
3 wavelength-division-multiplexed (WDM) light;
4 a measurement part for measuring either input
5 optical power of said WDM light on an input side of said
6 amplification medium or output optical power of said WDM
7 light on an output side of said amplification medium, or
8 both of them;
9 a variable gain equalizer connected on a
10 transmission line and capable of variably setting a
11 passing-wavelength characteristic;
12 a database for holding at least data
13 representing wavelength characteristics that
14 respectively correspond to transmission line types;
15 an arithmetic part for computing an inverted
16 passing-wavelength characteristic resulting from a
17 passing-wavelength characteristic of said variable gain
18 equalizer, based on an acquired transmission line type,
19 said optical power measured by said measurement part, and
20 said data held in said database; and
21 a setting part for setting a passing-wavelength
22 characteristic of said variable gain equalizer, based on
23 said inverted passing-wavelength characteristic computed
24 by said arithmetic part.

1 2. An optical amplifier comprising:
2 an amplification medium for amplifying
3 wavelength-division-multiplexed (WDM) light;
4 a measurement part for measuring either input
5 optical power of said WDM light on an input side of said
6 amplification medium or output optical power of said WDM
7 light on an output side of said amplification medium, or
8 both of them;
9 a variable gain equalizer connected on a
10 transmission line and capable of variably setting a
11 passing-wavelength characteristic;
12 a database for holding at least data
13 representing wavelength characteristics that
14 respectively correspond to transmission line types;
15 an acquisition part for acquiring the
16 transmission line type used;
17 an arithmetic part for computing an inverted
18 passing-wavelength characteristic resulting from a
19 passing-wavelength characteristic of said variable gain
20 equalizer, based on the transmission line type acquired
21 by said acquisition part, said optical power measured by
22 said measurement part, and said data held in said database;
23 and
24 a setting part for setting a passing-wavelength
25 characteristic of said variable gain equalizer, based on
26 said inverted passing-wavelength characteristic computed
27 by said arithmetic part.

1 3. The optical amplifier as set forth in claim 1,
2 wherein said measurement part measures a power of
3 excitation light on the input side of said amplification
4 medium.

1 4. The optical amplifier as set forth in claim 1,
2 wherein said database further holds information about a
3 transmission line length connected to said amplification
4 medium.

1 5. The optical amplifier as set forth in claim 1,
2 wherein:
3 said database holds wavelength characteristics
4 respectively corresponding to the input optical power and
5 output optical power of a centralized amplification type
6 transmission line; and
7 said arithmetic part is constructed to compute
8 said inverted passing-wavelength characteristic, based
9 on said wavelength characteristics corresponding to said
10 input optical power and output optical power held in said
11 database.

1 6. The optical amplifier as set forth in claim 5,
2 wherein said arithmetic part is constructed to compute
3 said inverted passing-wavelength characteristic so that
4 gain of said centralized amplification type transmission
5 line is constant.

1 7. The optical amplifier as set forth in claim 4,
2 wherein said arithmetic part is constructed to compute
3 said inverted passing-wavelength characteristic, based
4 on data causing the number of multiplexed wavelengths and
5 a wavelength characteristic due to a stimulated Raman
6 scattering effect to correspond to each other.

1 8. The optical amplifier as set forth in claim 4,
2 wherein said acquisition part is constructed to obtain
3 at least either information about a type of transmission
4 line connected to said amplification medium or information
5 about a length of said transmission line, from either
6 monitoring light from an upstream side of said transmission
7 line or a device monitoring system that monitors a status
8 of transmission.

1 9. The optical amplifier as set forth in claim 1,
2 wherein:
3 said database holds a wavelength characteristic
4 corresponding to a power of excitation light of a
5 transmission-line amplification type transmission line;
6 and
7 said arithmetic part is constructed to compute
8 said inverted passing-wavelength characteristic, based
9 on said wavelength characteristics respectively
10 corresponding to said power of excitation light held in
11 said database and said output optical power measured by

12 said measurement part.

1 10. The optical amplifier as set forth in claim 1,
2 wherein:

3 said arithmetic part is constructed to compute
4 said inverted passing-wavelength characteristic, based
5 on said data representing wavelength characteristics that
6 respectively correspond to transmission line types,
7 contained in light received from a first direction side
8 and provided on said first direction side, and based on
9 the number of multiplexed wavelengths contained in light
10 received from a second direction side; and

11 said setting part is constructed to set a
12 passing-wavelength characteristic of a portion in the
13 first direction side of said transmission line.

1 11. The optical amplifier as set forth in claim 1,
2 wherein:

3 said amplification medium employs a centralized
4 amplification type transmission line to amplify WDM light;
5 and

6 said setting part is constructed to set said
7 passing-wavelength characteristic, based on input optical
8 power and output optical power of said centralized
9 amplification type transmission line, after said variable
10 gain equalizer has been booted.

1 12. The optical amplifier as set forth in claim 1,
2 wherein:

3 said amplification medium employs a Raman
4 amplification type transmission line to amplify WDM light;
5 and

6 said setting part is constructed to set said
7 passing-wavelength characteristic, based on power of
8 excitation light of said Raman amplification type
9 transmission line, after said variable gain equalizer has
10 been booted.

1 13. The optical amplifier as set forth in claim 10,
2 wherein:

3 said arithmetic part is constructed to compute
4 said inverted passing-wavelength characteristic for said
5 first direction side, based on the data contained in
6 received light; and

7 said setting part is constructed to set the
8 inverted passing-wavelength characteristic to a portion
9 in the first direction side of said transmission line,
10 based on the data held in said database.

1 14. The optical amplifier as set forth in claim 10,
2 wherein:

3 said arithmetic part is constructed to compute
4 said inverted passing-wavelength characteristic for said
5 first direction side, based on the first data from the

6 self-station; and
7 said setting part is constructed to set said
8 inverted passing-wavelength characteristic to a portion
9 in the first direction side of said transmission line,
10 based on second data held in said database.

1 15. A passing-wavelength characteristic control
2 method in an optical amplifier, comprising the steps of:
3 measuring either input optical power of WDM
4 light on an input side of an amplification medium that
5 amplifies said WDM light, or output optical power of said
6 WDM light on an output side of said amplification medium,
7 or both of them, by a measurement part connected to said
8 amplification medium;
9 acquiring a transmission line type by an
10 acquisition part connected to said measurement part;
11 computing an inverted passing-wavelength
12 characteristic of a variable gain equalizer connected on
13 the transmission line and capable of variably setting a
14 passing-wavelength characteristic by an arithmetic part
15 connected to said measurement part, based on said optical
16 power measured at said measurement part, the acquired
17 transmissionline type, and at least data, held in a database,
18 which represents wavelength characteristics that
19 respectively correspond to transmission line types; and
20 setting a passing-wavelength characteristic of
21 said variable gain equalizer, based on said inverted

22 passing-wavelength characteristic computed at said
23 arithmetic part, by a setting part connected to said
24 arithmetic part.

1 16. An optical transmission system comprising:
2 a transmission line for transmitting an optical
3 signal; and
4 an optical amplifier for amplifying
5 wavelength-division-multiplexed (WDM) light that is
6 transmitted through said transmission line,
7 wherein said optical amplifier comprises
8 an amplification medium for amplifying said WDM
9 light,
10 a measurement part for measuring either input
11 optical power of said WDM light on an input side of said
12 amplification medium or output optical power of said WDM
13 light on an output side of said amplification medium, or
14 both of them,
15 a variable gain equalizer connected on said
16 transmission line and capable of variably setting a
17 passing-wavelength characteristic,
18 a database for holding at least data
19 representing wavelength characteristics that
20 respectively correspond to transmission line types,
21 an arithmetic part for computing an inverted
22 passing-wavelength characteristic resulting from a
23 passing-wavelength characteristic of said variable gain

24 equalizer, based on an acquired transmission line type,
25 said optical power measured by said measurement part, and
26 said data held in said database, and
27 a setting part for setting a passing-wavelength
28 characteristic of said variable gain equalizer, based on
29 said inverted passing-wavelength characteristic computed
30 at said arithmetic part.